

## MULE-HIDE PRODUCTS CO., INC. INSULATION GUIDELINES

### 1.0 Insulation Guidelines

- A. The following is a list of generic insulations acceptable for use under the Mule-Hide Roofing Systems. Requests for approval to use other types of insulation boards may only be made to Mule-Hide's corporate office in writing and such approval must specify the conditions for approval, project name and location of project.
- B. Mule-Hide Poly ISO 2 isocyanurate insulation is available in both flat stock and tapered. The use of the Mule-Hide Poly ISO 2 insulation is required for those projects where a full system warranty has been requested.
- C. Insulation must be no less than 1 inch thick with the exception of high-density wood fiberboard, extruded polystyrene and tapered boards. The minimum allowable thickness may be that required to span the flutes of a steel deck.
- D. Consult Mule-Hide if the insulation board manufacturer's current instructions conflict with information published herein. The board manufacturer's literature frequently establishes specific fastener placement criteria and restrictions of use.
- E. The applicable building codes should always be checked prior to proposing the application to Mule-Hide or the building owner.
- F. FM and UL fire-rated assemblies (specific thicknesses) are listed in the Factory Mutual Approval Guide and Underwriters Laboratories Building Material Directory and Fire Resistance Directory.

### 2.0 Insulation for Ballasted Systems

The following commonly used insulations are acceptable for ballasted applications:

<u>Insulation</u>	<u>Thickness (min.)</u>	<u>Remarks</u>
Expanded Polystyrene (EPS)	1"	½" Fiberboard Overlay Recommended <b>Not Over Coal Tar Pitch</b>
Extruded Polystyrene	¾"	½" Fiberboard Overlay Recommended <b>Not Over Coal Tar Pitch</b>
<u>Insulation</u>	<u>Thickness (min.)</u>	<u>Remarks</u>
Isocyanurate	1"	
Iso/Perlite Composite	1-1/4"	Iso Must Face Up. For Tear-Offs & New Construction Only.
Wood Fiberboard (High Density)	½"	High Density Only. On Metal Decks, Only Be Used As An Overlay.

### 3.0 Insulation for Mechanically Attached EPDM Systems

The following commonly used insulations are acceptable for mechanically attached applications:

<u>Insulation</u>	<u>Thickness (min.)</u>	<u>Remarks</u>
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Expanded Polystyrene (EPS)	1"	Installation Of ½" High Density
Fiberboard Overlay <b>Required</b>		<b>Not Over Coal Tar Pitch</b>
Extruded Polystyrene	¾"	Installation Of ½" High Density
Fiberboard Overlay <b>Required</b> Under		Black EPDM Membranes. <b>Not Over Coal Tar Pitch</b>
Isocyanurate	1"	
Wood Fiberboard (High Density)	½"	High Density Only. On Metal Decks, May Only Be Used As An Overlay.

#### 4.0 Insulation for Fully Adhered Systems

The following commonly used insulations are acceptable for fully adhered applications:

<u>Insulation</u>	<u>Thickness (min.)</u>	<u>Remarks</u>
Expanded Polystyrene (EPS)	1"	High Density Wood Fiberboard (½" min.) Overlay <b>Required</b> . <b>Not Over Coal Tar Pitch</b>
Extruded Polystyrene	¾"	High Density Wood Fiberboard (½" min.) Overlay <b>Required</b> .
Isocyanurate*	1"	<u>No</u> Foil Facers Permitted
Wood Fiberboard (High Density)	½"	High Density Only. On Metal Decks May Only Be Used As An Overlay.

\*Note: Isocyanurate insulation must have a facer approved by the insulation manufacturer for use under fully adhered EPDM systems.

#### 5.0 Minimum Insulation Specifications

- A. The following commonly used insulations are approved for use under Mule-Hide membrane. Requests for approval to use other types of insulation boards may only be made to Mule-Hide's corporate office in writing and such approval must specify the conditions for approval, project name and location of project.
1. Wood fiberboard (High Density) is currently one of the most popular recovery/insulation boards used today. The minimum thickness required is ½" for most applications when used as a recover board over existing roof systems or as an overlay over another insulation. A minimum of 1" thick (or greater) board may be required when installing the high density wood fiberboard directly over a fluted steel deck.
  2. Isocyanurate is becoming the most popular insulation for new construction and use with Mule-Hide roofing membranes. The same facers must be used on each side to reduce the chance of warping or curling. Foil facers are not acceptable for fully adhering. The minimum compressive strength shall be 18 psi at 10% deformation. The minimum thickness required is one inch (1"). When used over steel decks,

check with the insulation manufacturer to determine the required thickness of the insulation to span the flutes of the deck. Insulation Manufacturers must allow the use of the particular EPDM system over their insulation.

3. Extruded Polystyrene Boards must be a minimum of 3/4" thick. Extruded insulation must have a minimum density of 1.30 lb. with a minimum compressive strength of 15 psi at 10% deformation. Polystyrene boards cannot be used directly over coal tar pitch or newly resaturated/coated BUR roofs. Polystyrene is not acceptable with fully adhered or mechanically attached systems, unless overlaid with a minimum 1/2" thick high density wood fiberboard.
4. Expanded Polystyrene Boards must be a minimum of 1" thick and certified by the manufacturer to have a minimum density of 1.00 lb. and a minimum compressive strength of 10 psi at 10% deformation.  
Refer to the insulation manufacturer's minimum requirements for installation over a fluted steel deck. Polystyrene insulations cannot be installed directly over coal tar pitch or newly resaturated/coated BUR roofs. Polystyrene is not acceptable with fully adhered or mechanically attached systems unless overlaid with a minimum 1/2" thick high density wood fiberboard.
5. Perlite is a mineral fiber insulation board that Mule-Hide does not recommend be used in conjunction with the Mule-Hide Roofing Systems. However, should perlite be required to meet building codes, FM or UL requirements, the perlite **must** be overlaid with an acceptable insulation. **Perlite is not acceptable for use in recover applications.**
6. Fiberglass is not an acceptable insulation for use in the Mule-Hide Roofing Systems.

## 6.0 Insulation Fastening Patterns

- A. Insulation shall be mechanically attached using approved Mule-Hide fasteners per insulation manufacturer's specifications and FM wind uplift requirements. Should Mule-Hide's minimum requirements exceed the minimum rates published by the insulation manufacturer, Mule-Hide's minimum requirements must be followed.
- B. Refer to Mule-Hide details # MHE-200 through MHE-203 for Mule-Hide's minimum fastening patterns.

## 7.0 Other Methods of Insulation Attachment

- A. While Mule-Hide may accept (on a job to job basis) attachment of insulation with hot asphalt for use with Mule-Hide systems, asphalt is neither supplied nor manufactured by Mule-Hide; therefore, the attachment of the insulation with asphalt shall not be covered by Mule-Hide's Standard Warranty. However, if a qualified project designer specifies asphalt attachment, the following recommendations are given:
  1. Steep asphalt ASTM D312, Type III or IV, shall be specified
  2. Asphalt may only be used to attach approved insulations to primed structural concrete decks, properly nailed base sheets or a base layer of mechanically attached, approved insulation.
  3. Maximum insulation board size shall not exceed 4'x 4'. **4'x 8' boards are not permitted.**
  4. Expanded or extruded polystyrene insulation shall not be attached with asphalt.

- B. Other insulation adhesive products may be an acceptable method of attaching certain insulation boards to approved substrates. As Mule-Hide does not supply or manufacture insulation adhesives, the products must be installed in strict compliance with the requirements published by the manufacturer. Contact the manufacturer for information and recommendations regarding the appropriate use of these products. Mule-Hide must be contacted prior to the use of any such product. The attachment of the insulation is not covered by the Mule-Hide warranty.
- C. Mule-Hide Premium warranties require the insulation to be mechanically attached.

## **8.0 Insulation Storage**

- A. Insulation boards stored or stocked on the job site or roof must be stacked on pallets (or other supports) above the deck or ground.
- B. Insulation shall be covered with waterproof tarps to protect insulation from sun and inclement weather.
- C. Insulation shall not be stored on the job site for more than thirty (30) days if at all possible.
- D. Wet or damaged insulation must not be used in Mule-Hide roofing systems.

## **9.0 Insulation Application - Recommended Practices**

- A. For mechanically attached systems, insulation should be installed perpendicular to the direction the Mule-Hide field sheets are to be laid where possible.
- B. Install insulation boards in parallel courses with tightly-fitted and staggered joints. Cut all boards accurately to fit neatly around all projections and at all edges. Gaps greater than 1/4" shall be filled. Joints should be staggered a minimum of 8 inches.
- C. Do not use wet or damaged insulation boards. Install no more insulation than can be covered with seamed membrane and watertight details before any precipitation occurs.
- D. On steel decks, the ends of the insulation boards shall rest on the top of the flutes and not in suspension over the valleys. Where possible, boards should run perpendicular to the direction of the flutes of the deck.
- E. When two layers of insulation are used, the second layer must have the joints staggered to the first layer a minimum of 8 inches. One set of fasteners may be used to secure both layers of insulation unless otherwise required by the insulation board manufacturer.
- F. In accordance with Mule-Hide specifications, provide proper water cutoffs to completely seal the insulation on a daily basis.

**Caution:** Do not install over wet, damp or uneven substrates.

**Caution:** Keep all insulations away from fire, flame and ignition sources during storage and installation.

**End Of Section**